Medi-Cal data were available on an 11-year time span (July 1985–December 1996). Only the first episode of treatment for each patient was considered. Patients were further excluded if they were pregnant, they were in long-term facilities before and at the keydate, and if they lost their Medi-Cal eligibility during the study period.
RESULTS: In this study 30,200 patients met the eligibility criteria (mean age 60.8 + 19.4, 67.1% female). Among patients, 20.8% started their therapy with a calcium-channel-blocker, 18.7% with a diuretic, and 18.6% with a beta-blocker. Before the end of the study period, 94.2% of patients either discontinued or interrupted their antihypertensive medications. Average cost in the post-period (e.g., hospital, ambulatory care, and all other costs but prescription and long-term care) was $7945 for discontinuing versus $7525 for continuing patients (Wilcoxon-rank-sums test, $p = 0.0354$).
CONCLUSIONS: Patients who interrupt their antihypertensive medications cause a higher healthcare expenditure than continuous patients. Further analyses are needed considering co-factors that may influence healthcare utilization.

TPCP6

THE ROLE OF ALTERNATIVE ANTIHYPERLIPIDEMIC DRUGS: PATIENT COMPLIANCE, HEALTHCARE UTILIZATION, AND HEALTHCARE COSTS

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OBJECTIVE: To compare the effects of hydroxymethylglutaryl coenzyme A (HMG-CoA) reductase inhibitors (statins) with non-statins on compliance duration, healthcare utilization, and healthcare costs in an health maintenance organization (HMO) population.
METHODS: A retrospective cohort study was performed using claims data and survey data in continuously enrolled patients ($n = 810$) with prescriptions for antihyperlipidemic medications from April 1993 to March 1995. Compliance duration was defined as the duration of over 80% compliance with antihyperlipidemic medications, healthcare utilization measures as hospital admissions due to cardiac diseases and outpatient visits, and healthcare cost variables as total healthcare costs, net costs, and drug cost. Each main outcome measure was modeled (Tobit model for compliance duration, probit model for healthcare utilization, and OLS model for healthcare costs).
RESULTS: The statins significantly prolonged the compliance duration ($p < 0.05$). The factors significantly influencing on compliance duration were female gender, baseline high compliance, chronic disease scores, number of cholesterol-lowering drugs in the regimen, and diagnostic characteristics such as peripheral vascular diseases (PVD), cardiac diseases (CVD), hypertension, and diabetes. The statins significantly decreased adjusted hospital admissions due to CVD in year 1 ($p < 0.05$) especially in those patients with PVD ($p < 0.01$) and CVD ($p < 0.05$). There was no significant difference in total healthcare costs in year 1 between patients on statins and those on non-statins. However, in year 2 and pooled data (year 1 and year 2), the statins were significantly associated with higher total healthcare costs ($p < 0.05$, p-pooled < 0.05) and higher drug costs ($p < 0.0001$, p-pooled < 0.0001).
CONCLUSIONS: The statins improved patient's compliance of antihyperlipidemic therapy. The statins also decreased the hospital admissions due to CVD without significantly elevated healthcare costs in the short term (year 1).

TPCP7

A PATH ANALYTIC STUDY OF THE ASSOCIATION BETWEEN PHARMACISTS' DIRECTIVE GUIDANCE BEHAVIORS, PATIENT SATISFACTION, PATIENT COMPLIANCE, AND HEALTH-RELATED QUALITY OF LIFE (HRQoL)

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The ultimate goal of pharmaceutical care is to improve patient HRQoL. Although researchers have attempted successfully to link pharmaceutical care behaviors with HRQoL, the findings are not consistent. Furthermore, the role of patient satisfaction and compliance in this relationship needs to be explored.
OBJECTIVE: To test a path analytic model depicting the association of pharmacists' directive guidance behaviors, patient satisfaction, compliance, and HRQoL. Pharmacists' directive guidance behaviors were used as an indicator of the level of pharmaceutical care.
METHODS: Five ambulatory care pharmacies/clinics were selected for study participation. A 50-item questionnaire eliciting information about demographics, perception about pharmacists' directive guidance behaviors, satisfaction with pharmaceutical care behaviors, compliance and HRQoL was administered to volunteers at each study site. A total of 160 patients completed the questionnaire.
RESULTS: Bivariate correlations showed that directive guidance behaviors were significantly correlated to patient satisfaction ($r = 0.56$, $p < 0.001$), and SF-12 Physical Component Summary (PCS) and Mental Component Summary (MCS) scores ($r = -0.19$, $p < 0.05$; $r = -0.19$, $p < 0.05$, respectively). Also, patient satisfaction was significantly correlated to PCS ($r = -0.20$, $p < 0.05$). Compliance was significantly correlated to PCS ($r = 0.25$, $p < 0.01$) and MCS ($r = 0.23$, $p < 0.01$). Two path analytic models using PCS and MCS as dependent variables were tested. In path analysis with PCS as the dependent variable, compliance had significant total causal effect of 0.16 ($p < 0.05$) that was due to its direct effect. No other path coefficients were significant in this model. In path analysis with MCS as the dependent variable, no path coefficients were significant.

CONCLUSIONS: In the two path analytic models evaluated, only patient compliance had a significant direct effect on PCS. Re-specification of the models is needed.

DECISION ANALYTIC MODELING

TPDM1

ASSESSING THE PREDICTIVE ABILITY OF A DETERMINISTIC MODEL AND STOCHASTIC MODEL

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Formulary decisions are often based upon the safety, efficacy, and projected costs of medications. Models used to predict costs are rarely assessed to determine their predictive ability.
OBJECTIVE: The purpose of this study was to assess the ability of a decision analytic deterministic model and a regression analytic stochastic model to predict the diabetes-specific costs incurred during the 12 months after metformin was added to an HMO formulary. The ability of the stochastic model to predict total healthcare costs was also assessed.
METHODS: The deterministic model, a decision tree, was constructed within an equilibrium framework using literature-based probabilities and internal costs to predict diabetes-specific costs. A regression model was constructed using medical and pharmacy claims data to predict diabetes-specific cost and total healthcare costs.
RESULTS: The total diabetes-specific cost estimate predicted by the decision analytic model came within 5% of actual costs. The model underestimated the diabetes-specific medical costs and overestimated the diabetes-specific pharmacy costs. The diabetes-specific regression model produced an estimate that was within 18% of the actual costs. The total healthcare cost model estimate was within 7% of the actual costs. The total and diabetes-related medical cost estimates were within 6% and 46% of the actual costs respectively. The total and diabetes-specific pharmacy costs were within 20% and 49% of the actual costs, respectively.
CONCLUSION: Further research is needed to refine model construction techniques. A decision tree constructed with internal data should be used to predict disease-specific costs when only medical and pharmacy claims data from the previous year are available, and a regression model should be used to predict total healthcare costs.

TPDM2

COST-EFFECTIVENESS OF INCREASING WARFARIN USAGE FOR STROKE PROPHYLAXIS IN PATIENTS WITH ATRIAL FIBRILLATION

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In response to mounting pressures to improve stroke prophylaxis for patients with atrial fibrillation, many hospitals and healthcare systems have opened specialty anticoagulation clinics.
OBJECTIVE: The purpose of this study was to determine the cost-effectiveness of stroke prophylaxis from a hospital system perspective.
METHODS: We have developed a decision model representing several options for stroke prophylaxis. Simulated patients could receive warfarin through either an anticoagulation clinic or their family physician, aspirin, or no therapy. Possible events were thromboembolic stroke, hemorrhagic stroke, hemorrhage requiring hospitalization (major hemorrhage), or hemorrhage requiring a clinic visit and/or warfarin dose adjustment (minor hemorrhage). Three different scenarios of stroke prophylaxis are presented: 1) a healthcare system with an anticoagulation clinic; 2) a system which maximizes anticoagulation with warfarin via the family physician; and 3) a system which maximizes anticoagulation but utilizes anticoagulation clinics to a larger extent.
RESULTS: Option 1 was the least costly and effective strategy with a 10-year average cost of $6327/patient treated and a life expectancy of 7.728 years. The values for 2 and 3 were $6549 and 7.735 life-years, and $6443 and 7.761 life-years, respectively. The incremental cost-effectiveness was $34,339/life-year saved for 2 versus 1 and $4013/life-year saved for option 3 versus 1. Option 3 was dominant over 2. These results were sensitive to the cost per clinic or office visit and the rate of occurrence of major hemorrhage.
CONCLUSION: Increasing warfarin utilization is cost-effective from a healthcare system's perspective. Anticoagulation clinics appear to be the best method for achieving this goal.

TPDM3

IS THERE POTENTIAL BIAS IN MODELING WITH DECISION ANALYTIC SOFTWARE OR MATRIX PROGRAMMING?

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Decision analytic software is commonly used to estimate long-term costs or effects of treatment by using Markov models. Monte Carlo simulation is used to estimate confidence limits (CL) for costs or effects in decision models. Exact cost or effects may be calculated by matrix inversion. CL for costs and effects may be calculated from matrix inversion by using distributions for each transition probability.
OBJECTIVES: The objective of this study was to validate decision analytic software by comparing the bias in decision analytic CL and matrix CL.